

reference 3

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-126118

(43)Date of publication of application : 09.05.2000

(51)Int.Cl.

A61B 1/00

G02B 23/24

(21)Application number : 10-302361

(71)Applicant : OLYMPUS OPTICAL CO LTD

(22)Date of filing : 23.10.1998

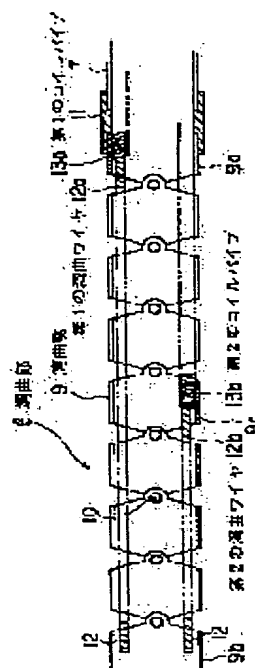
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(57)Abstract:

PROBLEM TO BE SOLVED: To sufficiently observe the inside of a wide body-cavity under an optional curved shape by providing a second traction means which tows a first operation wire being passed through a first guide tube when a second operation wire being passed through a second guide tube is towed by a traction means, on an operation section.

SOLUTION: When an operation lever is rotated counterclockwise further by a portion for a specified angle, a pin member provided on a hook section, comes into contact with a first curved wire 12a. When the rotation is further advanced, the pin member tows the first wire 12a, and the first curved wire moves to the right. The tip end of a first coil pipe 13a which passes in the first curved wire 12a, is fixed to the base end side by a knotted ring 9c, and by the movement of the first curved wire 12a, a curved section 6 is further curved into two stages in the opposite direction from the base end side of the curved section 6, while keeping a state wherein the tip end side is curved in a small scale to the side of a second curved wire 12b. For example, the curved section 6 curves into two stages in a bladder, and a ureteral opening can be observed by a proper observation distance.



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CLAIMS

[Claim(s)]

[Claim 1]While a final controlling element is connected with the base end side of an insert portion inserted into the abdominal cavity, While providing a bend which connected two or more curved pieces with the tip part side of said insert portion one by one along shaft orientations of said insert portion and attaching a tip of a curved wire to the tip side of said bend, By inserting in said curved wire in a flexible guide pipe inserted in in the end face said insert portion side, enabling a free attitude, and towing said curved wire by the 1st traction means provided in said final controlling element. In an endoscope said bend was made to curve, fix the 1st guide pipe to said bend end face, and fix the 2nd guide pipe that opposes to a curved piece of pars intermedia of said bend, and. An endoscope providing the 2nd traction means that tows the 1st operation wire inserted in said 1st guide pipe in said final controlling element when said 2nd operation wire inserted in said 2nd guide pipe is towed by said traction means.

[Claim 2]The endoscope according to claim 1, wherein said 2nd traction means consists of a hooking portion provided on the 1st traction means.

[Claim 3]An insert portion provided with a bend.

Two or more curved wires in which an end was connected with said bend.

A final controlling element which has a curving operation means which is connected to a end face of said insert portion, tows said curved wire, and carries out curving operation of said bend. While it is the endoscope provided with the above and said bend forms the 1st curving state that curves by two or more curved pieces by the side of a tip, and the 2nd curving state that curves by two or more curved pieces which constitute a bend, It was provided with a control means which tows said curved wire of another side and carries out curving operation to said 2nd curving state, said curving operation means having towed said one curved wire, and holding said bend to said 1st curving state.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention tows the curved wire connected to the end face of an insert portion, and relates to the endoscope provided with the final controlling element which has a curving operation means which carries out curving operation of the bend.

[0002]

[Description of the Prior Art]The bend in which curving operation is possible is allocated in a part of insert portion which generally has the flexibility inserted into the abdominal cavity in the endoscope of elasticity like the cystoscope. In narrow space like a bladder, in order to observe efficiently the observation object which makes the start the ureterostoma in the position near the ostium urethrae internum, it is necessary to incurvate a bend as small as possible. As a bend of this kind of endoscope, JP,7-30003,Y, JP,1-303121,A, and JP,63-62213,B are known, for example.

[0003]

[Problem(s) to be Solved by the Invention]However, as for JP,7-30003,Y, only the tip side of a bend is only crooked arbitrarily. For example, in the case to which the ostium urethrae internum and the ureterostoma are close in the case of the elasticity cystoscope, However only a tip may curve small, when it is going to observe the ureterostoma, an endoscope tip will approach the ureterostoma aslant anatomically, It may be difficult to fully observe the ureterostoma from a transverse plane, or may separate from the observation area in which a tip lens approaches an object too much conversely and which is focused normally.

[0004]Although a bend curves to two step types in the direction opposite in the same flat surface, since the angle wire crosses, JP,1-303121,A will curve to two step types similarly in which near curving operation. Therefore, what is called **** to which the curve of 180 degrees or more is applied and that observes an anterior-wall-of-urinary-bladder part and the neighborhood of the ostium urethrae internum will not be made, for example like the usual elasticity cystoscope, but the flexibility of observation will decrease in the large abdominal cavity.

[0005]JP,63-62213,B makes arbitrary curving operation possible by allocating a shape memory alloy in each curved piece pipe. Since the energizing heating means for heating a shape memory alloy is needed, structure becomes complicated, and there is a problem that cost also starts.

[0006]This invention was made paying attention to said situation, on the other hand, the opposite side is large, the place made into that purpose can curve, and it supposes that a curve in the direction with which the tip [of a bend] and end face side disagrees is possible for the other side, and is in providing the endoscope which enough enables observation of the inside of the large abdominal cavity with arbitrary curved shape.

[0007]

[Means for Solving the Problem]In order that this invention may attain said purpose, claim 1, While a final controlling element is connected with the base end side of an insert portion inserted into the abdominal cavity, While providing a bend which connected two or more curved pieces with the tip part side of said insert portion one by one along shaft orientations of said insert

portion and attaching a tip of a curved wire to the tip side of said bend, By inserting in said curved wire in a flexible guide pipe inserted in in the end face said insert portion side, enabling a free attitude, and towing said curved wire by the 1st traction means provided in said final controlling element. In an endoscope said bend was made to curve, fix the 1st guide pipe to said bend end face, and fix the 2nd guide pipe that opposes to a curved piece of pars intermedia of said bend, and. When said 2nd operation wire inserted in said 2nd guide pipe was towed by said traction means, the 2nd traction means that tows the 1st operation wire inserted in said 1st guide pipe was provided in said final controlling element.

[0008]Claim 2 consists of a hooking portion by which said 2nd traction means of claim 1 was established on the 1st traction means. An insert portion for which claim 3 prepared a bend, and two or more curved wires in which an end was connected with said bend, In an endoscope which it had, a final controlling element which has a curving operation means which is connected to a end face of said insert portion, tows said curved wire, and carries out curving operation of said bend said bend, While forming the 1st curving state that curves by two or more curved pieces by the side of a tip, and the 2nd curving state that curves by two or more curved pieces which constitute a bend, said curving operation means, It had a control means which tows said curved wire of another side and carries out curving operation to said 2nd curving state, having towed said one curved wire and holding said bend to said 1st curving state.

[0009]When according to claims 1 and 2 curving in the direction with it and curving to the other side, only the tip side curves in the direction and the end face side curves in the opposite direction at two step types. [the whole bend large in one way, and] [same to it]

[0010]Holding to the 1st curving state that tows one curved wire and curves by two or more curved pieces by the side of a tip according to claim 3, a curved wire of another side can be towed and curving operation can be carried out to the 2nd curving state.

[0011]

[Embodiment of the Invention]Hereafter, each embodiment of this invention is described based on a drawing. Drawing 1 – drawing 6 show a 1st embodiment, and drawing 1 shows the general drawing of the endoscope 1. The endoscope 1 comprises the insert portion 2, the final controlling element 3, and the eye contacting part 4 from the tip side. The insert portion 2 comprises the tip part 5, the bend 6, and the flexible part 7, and a curve is hung by the control lever 8 by which the bend 6 was formed on the final controlling element 3.

[0012]The internal structure of the bend 6 is shown in drawing 2. In the bend 6, two or more **** 9 are connected focusing on the rivet 10 inside the shell tube (not shown) by the rivet 10, enabling free rotation. **** 9a of the last end is connected to the connecting member 11 provided at the tip of the flexible part 7. The two curved wires 12 are being fixed to latest **** 9b by the position symmetrical with abbreviation by low attachment etc. to the longitudinal shaft.

[0013]The curved wire 12 is inserted in the coil pipe 13 of the shape of each close winding in the state movable to shaft orientations. The 1st coil pipe 13a as the 1st guide pipe with which the 1st curved wire 12a that is one side of the curved wire 12 is communicating secretly, The tip is fixed, and is in **** 9a of said connecting member 11 or the last end, and the tip of the coil pipe 13b as the 2nd guide pipe with which the 2nd curved wire 12b of another side is communicating secretly is being fixed to **** 9c of the bend 6 mostly located in the center. The end face side of the coil pipe 13 is being fixed inside the final controlling element 3 (not shown).

[0014]The internal structure of the final controlling element 3 is shown in drawing 3 (a) and (b). Drawing 3 (b) is a sectional view which meets the A-A line of drawing 3 (a). The end face side of said curved wire 12 is being fixed to the circumference of the disc-like drum 14 in the state which can be rolled round. The curved wire 12 and the drum 14 may carry out connection fixation of the curved wire 12 via the wire which was not fixed directly but was beforehand fixed to the drum 14. The drum 14 is being fixed in the state of said control lever 8 and the same axle via the axis 16 penetrated in the moisture dense state with the O ring (not shown) etc. to the casing member 15 of the final controlling element 3 enabling free rotation.

[0015]The hooking portion 17 is formed on the circumference of the drum 14. The pin member 18 parallel to said axis 16 is formed in the hooking portion 17. The pin member 18 is in the

position which contacts said curved wire 12a side, when the drum 14 rotates only the angle theta.

[0016]Therefore, if the control lever 8 is clockwise rotated by drawing 3, the drum 14 will also rotate in the direction with the axis 16. Thereby, the 1st curved wire 12a moves rightward by drawing 3. Since the tip of the 1st curved wire 12a is fixed to **** 9b by the side of the tip of the bend 6, all the **** 9 will rotate clockwise focusing on the rivet 10, respectively, and, as a result, the bend 6 will curve greatly at the overall length like the usual endoscope.

[0017]On the other hand, the case where the control lever 8 is rotated counterclockwise is shown in drawing 4 (a), (b) - drawing 6. By operation of the control lever 8, the 2nd curved wire 12b moves rightward [of drawing 4]. Since the tip of the close-winding-like 2nd coil pipe 13b in which the 2nd curved wire 12b is communicating secretly is fixed to **** 9c, it cannot be counterclockwise rotated with the tension of the 2nd coil pipe 13b from **** 9c by **** 9 by the side of a end face. therefore, it is in the tip side from **** 9c -- it is accepted **** 9, and it will rotate and only the tip side will curve small like drawing 4 (b) in the bend 6.

[0018]The pin member 18 which furthermore formed the control lever 8 in the hooking portion 17 by the angle theta counterclockwise when it was made to rotate contacts the 1st curved wire 12a. If rotation furthermore progresses, as shown in drawing 5, the pin member 18 will tow the 1st curved wire 12a, and will move the 1st curved wire 12a rightward [of drawing 4]. The tip of the 1st coil pipe 13a in which the 1st curved wire 12a is communicating secretly, Since it is being fixed by the end face side from **** 9c, it curves from the end face side of the bend 6 to a counter direction further at two step types with the state where the tip side is small to the 2nd curved wire 12b side, and the bend 6 curved by movement of the 1st curved wire 12a. Drawing 6 is an example which observes the inside of a bladder. Since the bend 6 curves to two step types, it can observe the ureterostoma 20 in the optimal observation distance 19 in a bladder.

[0019]Drawing 7 shows a 2nd embodiment, and the 1st embodiment and identical configuration portion attach the same number, and omit explanation. Drawing 7 (a) shows the internal structure of the final controlling element 3. Drawing 7 (b) is a sectional view which meets the B-B line of drawing 7 (a). On both sides of the control lever 8, the same axle, and the casing member 15, the 2nd control lever 21 is formed in the final controlling element 3 of said curved wire 12 at the opposite position. The 2nd drum of the 2nd control lever 21 is connected with 23 via the 2nd axis 22 penetrated in the moisture dense state to the casing member 15 of the final controlling element 3 enabling free rotation. The 2nd drum of the hooking portion 17 in a 1st embodiment is formed in 23.

[0020]Therefore, if the control lever 8 is clockwise rotated by drawing 7, in the bend 6 at a tip, a curve will start greatly covering bend 6 overall length, and if an opposite direction is rotated, the bend 6 will curve small only a tip. If the 2nd control lever 21 is furthermore rotated counterclockwise if needed, while a tip is small and the bend 6 had curved, the end face side of the bend 6 will curve also to a counter direction further.

[0021]Since curving operation of two step types can be operated by the independent control lever according to this embodiment, the way person can choose curved shape according to an observation part and a gestalt. Drawing 8 and drawing 9 show a 3rd embodiment, and the 1st embodiment and identical configuration portion attach the same number, and omit explanation. Drawing 8 shows the internal structure of the final controlling element 3. Here, the control lever 8 is already counterclockwise operated on drawing 8, and the state where the 2nd curved wire 12b is already towed rightward is shown.

[0022]The penetrating port 24 is formed in the position which counters the casing member 15 with the 1st curved wire 12a, and the heights 25 are further formed in the circumference of this penetrating port 24. The bar member 26 is inserted in the penetrating port 24. One side of the bar member 26 is in contact with the 1st curved wire 12a, and the button part 27 is formed in another side. Between the heights 25 and the button part 27, the energizing means 28 which consists of cylindrical rubber etc. is established. One side of this energizing means 28 has connected the heights 25 and another side with the button part 27 in the moisture dense state, respectively. The bar member 26 is energized in the button part 27 direction by this energizing

means 28.

[0023]Therefore, like a 2nd embodiment, after rotating the control lever 8 counterclockwise on drawing 8, the button part 27 is pushed in the casing 15 direction. The final controlling element 26 will push the 1st curved wire 12a in the 2nd direction of curved wire 12b, and, as a result, the 1st curved wire 12a will be towed rightward on drawing 9. If a finger is lifted from the button part 27, the bar member 26 will return to an initial state by the energizing means 28, and, thereby, the 1st curved wire 12a will also be wide opened from a towage state.

[0024]According to this embodiment, since the 2nd wire traction operation is push button operation, it does not mistake for the usual curved lever and 2 step-type curving operation becomes certainly possible. Since it is the operation pushed in toward a curved lever and a difference final controlling element center, a final controlling element does not blur during operation and it can be operated safely.

[0025]According to said embodiment, the following composition is obtained.

(Additional remark 1) While a final controlling element is connected with the base end side of the insert portion inserted into the abdominal cavity, While providing the bend which connected two or more curved pieces with the tip part side of said insert portion one by one along the shaft orientations of said insert portion and attaching the tip of a curved wire to the tip side of said bend, By inserting in said curved wire in the flexible guide pipe inserted in in the end face said insert portion side, enabling a free attitude, and towing said curved wire by the 1st traction means provided in said final controlling element. In the endoscope said bend was made to curve, fix the 1st guide pipe to said bend end face, and fix the 2nd guide pipe that opposes to the curved piece of the pars intermedia of said bend, and. The endoscope providing the 2nd traction means that tows the 1st operation wire inserted in said 1st guide pipe in said final controlling element when said 2nd operation wire inserted in said 2nd guide pipe is towed by said traction means.

[0026](Additional remark 2) Said 2nd traction means of the additional remark 1 consists of a hooking portion provided on the 1st traction means.

(Additional remark 3) The insert portion provided with the bend, and two or more curved wires in which the end was connected with said bend, In the endoscope which it had, the final controlling element which has a curving operation means which is connected to the end face of said insert portion, tows said curved wire, and carries out curving operation of said bend said bend, While forming the 1st curving state that curves by two or more curved pieces by the side of a tip, and the 2nd curving state that curves by two or more curved pieces which constitute a bend, said curving operation means, The endoscope having a control means which tows said curved wire of another side and carries out curving operation to said 2nd curving state having towed said one curved wire and holding said bend to said 1st curving state.

[0027](Additional remark 4) An endoscope, wherein said 2nd traction means of the additional remark 1 operates independently with the 1st traction means.

(Additional remark 5) An endoscope, wherein said 2nd traction means of the additional remark 1 or 2 consists of a lever member located on the 1st traction means and the same axle, and a hook member interlocked with said lever member.

[0028](Additional remark 6) An endoscope, wherein said 2nd traction means of the additional remark 1 or 2 consists of a bar member for moving said 1st operation wire to a longitudinal direction and an abbreviated perpendicular direction.

[0029]When according to said 1-3rd embodiments curving in the direction with it as it and curving to the other side, [the whole bend large in one way, and] [same] It is only the tip side's curving in the direction and having made it the end face side curve in the opposite direction at two step types, While covering a wide observation area with a big curve angle like the conventional endoscope, it becomes observable from the optimal observation distance about the part which approached the insert portion if needed, and it becomes possible to overlook a lesion part and to observe that there is nothing.

[0030]Drawing 10 - drawing 12 show the example 1 of an indication, and show drawing 10 the endoscope disinfection case 50. The endoscope disinfection case 50 consists of the main part 51 and the frame part 52. The main part 51 has the box-like or cylindrical case part 53 which

has the almost same depth as the overall length of an endoscope, and has the slide rail part 54 along with the longitudinal direction in the side.

[0031]The frame part 52 comprises the axis 55 and the endoscope hooking portion 56 which are being engaged movable along with said slide rail part 54, and the insert portion guide 57. It has projected in the position vertical to the axis 55, and the insert portion guide 57 is parallel to the axis 55, and the endoscope hooking portion 56 has it in physical relationship which is settled in said case part 53, when the axis 55 moves along with said slide rail part 54. The end supporting part 58 of ring shape which has a sufficiently bigger path than the insert portion outer diameter of an endoscope in the direction with an end of the insert portion guide 57 vertical to the direction of a longitudinal shaft is formed.

[0032]According to the example 1 of an indication, as shown in drawing 11, after the endoscope technique finishes and fundamental washing is completed, an antibacterial is collected to the case part 53. Next, after inserting the insert portion 2 of the endoscope 1 in the end supporting part 58 and putting the final controlling element 3 on the endoscope hooking portion 56, the axis 55 is moved along with the slide rail part 54, and the insert portion 2 of the endoscope 1 and the whole final controlling element 3 are immersed in the antibacterial in the case part 53 the insert portion guide 57 and the whole end supporting part 58.

[0033]After sufficient disinfection time passes, as shown in drawing 12, the axis 55 is pulled up along with the slide race part 54. And the endoscope 1 is removed from the frame part 52. Under the present circumstances, the insert portion 2 of the endoscope 1 can be removed from the case part 53 in comfort, maintaining a disinfection state, in order not to touch near the opening of the case part 53 in which it shakes and the antibacterial has not accumulated since it is in the end supporting part 58 accidentally. Even if the insert portion 2 shakes somewhat and it touches on the insert portion guide 57, since the insert portion guide 57 is immersed in the antibacterial together, it will not spoil the disinfection state of the insert portion 2 too.

[0034]Thus, extraction from a washing case of the washing person in charge of an endoscope becomes possible in comfort, without paying superfluous attention to touching a field dirty after a long insert portion's washing.

[0035]In the case where an endoscope has the composition which consists of an insert portion, a final controlling element which a way person holds, and a light guide cable to which the illumination light of a light source is led, The art in which the light guide cable is formed to the final controlling element enabling free desorption is indicated to JP,8-297249,A, JP,63-24882,Y, JP,57-67702,Y, etc. That is, drawing 13 (a) shows the state before connection of a light guide cable, and the figure (b) shows the state after connection.

[0036]However, both cap for connection had exposed the thing of said gazette in the final controlling element and the terminal area of the light guide cable. Therefore, filth infiltrates into the uneven part of a cap and postoperative washing is complicated. The transmission loss of the illumination light serves as heat, and is transmitted to a cap, and there is a possibility of a terminal area becoming feverish and having an adverse effect on a way person.

[0037]Drawing 14 (a) and (b) is the example 2 of an indication which solved the above problems, and postoperative washing is easy for it, and the endoscope of the light guide cable attachment-and-detachment type which does not have an adverse effect on a way person is shown.

[0038]Drawing 14 shows the final controlling element 61 of an endoscope, and the terminal area 63 of the light guide cable 62. This is in the state before connection. The final controlling element 61 is being fixed to the cap 66 watertight [the light guide fiber bunch 65 which has the incidence edge 64 of the illumination light] with adhesives etc. Screwing immobilization of the cap 66 is carried out with the nut 69 watertight via O ring 68 to the final controlling element coat 67.

[0039]On the other hand, the light guide fiber bunch 70 which draws the illumination light is inserted in the inside of the light guide cable 62 from a light source to the final controlling element 61. 71 is an emitting end by the side of the final controlling element 61 of the illumination light. The light guide fiber bunch 70 is being fixed to the emitting end 71 side by the cap 72 with adhesives etc. Connection fixation of the cap 72 is carried out to the flexible pipe 73. The flange 74 is formed in the end of the cap 72, and the circular elastic member 75 is

formed in the flexible pipe 73 side. There is the cover member 76 which has elastic members, such as a synthetic rubber, in the periphery of the cap 72, and it hangs on the flexible pipe 73 side, tapers off, and has shape. The end is slightly formed small rather than the outer diameter of the flexible pipe 73.

[0040]The cap 77 by which insert molding was carried out is formed in the inner circumference by the side of the final controlling element 67 of the cover member 76, and it has the same end face as the elastic member 78 of a periphery. The projection 79 with a circular outermost periphery part of the elastic member 77 is formed towards the final controlling element 67 side. The heights 80 which stop the flange 74 to the final controlling element 67 side via the elastic member 75 are formed in the flexible pipe 73 side of the cap 77.

[0041]Next, an operation is explained using drawing 14 in the state where the light guide cable 62 was connected to the final controlling element 67 (b). If a way person grasps the elastic member 78 and makes the cap 66 and the cap 77 screw, the incidence edge 64 and the emitting end 77 will contact first. The elastic member 75 is pinched by the flange 74 and the heights 80, and carries out elastic deformation, and the incidence edge 64 and the emitting end 77 are pressed, and are stuck. On the other hand, elastic deformation of the projection 79 is pressed and carried out to the final controlling element coat 67. namely, the thing for which the terminal area 63 becomes the appearance covered with the cover member 76 over the whole, and postoperative washing is easy for it, and it has an adverse effect on a way person — there is nothing.

[0042]Although the projection 79 was formed in the end of the elastic member 78 of the cover member 76, it will not interfere, if the final controlling element coat 67 contacts the elastic member 78 at the time of the completion of connection. According to said example of an indication, the following composition is obtained.

[0043](Additional remark 7) Arrange the incident end part of the light guide for transmitting the illumination light which illuminates a photographic subject to a final controlling element, and. In the endoscope connected to said final controlling element enabling free attachment and detachment, the emitting end part of the light guide cable for supplying the illumination light to said light guide at the time of connection of a light guide cable. The light guide cable attachment-and-detachment type endoscope which covering a terminal area by the cover member covered in the outside surface by the elastic member, and the one end perimeter side of an elastic member being contacted by the final controlling element, and the other end being contacted by the light guide cable peripheral face.

[0044](Additional remark 8) The light guide cable attachment-and-detachment type endoscope characterized by a cover member being a part of connecting means in the additional remark 7. Since a final controlling element and the terminal area of a light guide cable are covered by the low rubber member of a heat transfer coefficient according to said composition, even if it applies filth to a final controlling element, the uneven part of a terminal area does not become dirty and postoperative washing is easy.

[0045]Even if it originates in the loss of the illumination light and a terminal area becomes feverish, since a rubber member softens heat conduction to a way person, a way person is not burned. In addition, since a portion with the necessity of touching on the occasion of connection work is a product made of rubber, a finger rest loan is good, and is not slippery, and connection work can be performed certainly. When using an endoscope, the way person has carried the rubber glove, but it is effective in that there is no possibility that this rubber glove may be torn.

[0046]On the other hand, as for the insert portion of the conventional endoscope, the curved pipe is formed between the flexible tube and the end member, and a curved pipe is compulsorily incurvated in an operation wire by the traction operation by the side of the hand to pass. The common curved pipe is pivoted by the rivet, enabling free rotation, where it arranged two or more **** in the single tier to the longitudinal direction of the endoscope inserting part and the lug piece of adjoining **** is piled up.

[0047]The art which used laser welding for connection of **** in the rivet is indicated by the Japanese-Patent-Application-No. No. 61239 [nine to] gazette. The art currently indicated by the gazette is shown in drawing 15, (a) is the rivet 81 used for junction of ****, as shown in (b), the rivet 81 lets the hole 83 established in lug piece.82 of one of the two pass, and fused

junction of the apical surface is carried out to the side of the lug piece 84 of another side by laser beam L.

[0048]Although the figure (b) is in the state after laser junction, in the fused junction side of the end face of the rivet 81, and the lug piece 84, a foot section is formed of surface tension with the material of the rivet 81 fused liquefied and the lug piece 84. This foot section needed to set up beforehand the crevice shown in [1] a figure, in order to have acquired the smooth rotation state of ****, since it became a large diameter rather than the rotating shaft of the rivet 81. That is, in order to secure this I, the joined part of **** had a problem which becomes large in the shaft orientations of the rivet 81.

[0049]The example 3 of an indication was made paying attention to the above situations, and aims at miniaturizing the joined part of **** in the longitudinal direction of a rivet. Drawing 16 shows the endoscope 91, and fundamental composition is the same as a 1st embodiment shown in drawing 1, it gives the same number to an identical configuration portion, and omits explanation. The structure of the bend 6 is shown in drawing 17. Two or more **** 93 are allocated by the longitudinal direction inside the covering rubber 92. In the lug piece 94 provided on the vertical angle, **** 93 is respectively joined by both ends by the rivet 95, and each **** 93 moves to a curving direction focusing on the rotating shaft of the rivet 95.

[0050]Drawing 18 shows the connected state of lug piece 94 comrades. The lug piece 94a is formed in the end of **** 93a of the left-hand side in drawing 18. The hole 97 which the narrow diameter portion of the rotating shaft 96 of the rivet 95 penetrates is established in the lug piece 94a, and the lug piece 94b in which the apical surface 99 of the opposite hand of the major diameter 98 of the rivet 95 is contacted is formed in opposite **** 93b. When laser beam L is irradiated by the back of the lug piece 94b, the apical surface 99 and the lug piece 94b are unified. As shown in drawing 19, the chamfer 100 is formed in the end of the rotating shaft 96 of the rivet 95.

[0051]Next, an operation of this example of an indication is explained. The state where junction by laser was completed is shown in drawing 20. Fused junction of the contact part of the apical surface 99 and the lug piece 94b is carried out, and the rivet 95 and the piece 101 of melting of the lug piece 94b which became liquefied by the contact part flow into the gap formed with the chamfer 100 and the lug piece 94b. As a result, the piece 101 of melting is solidified without exceeding the outer diameter of the rotating shaft 96, and fused junction of the lug piece 94b is carried out to the rivet 95. Not the thing of the shape of the chamfer 100 influenced how but the thing which cutted off the peripheral surface of the apical surface 99 the corners round may be used.

[0052]Drawing 21 and drawing 22 show the modification of the 3rd example of an indication, provide a level difference in the rotating shaft 96 of the rivet 95, and form the thin diameter section 103 whose path is smaller than the rotating shaft 102. the thin diameter section 103 serving as a gap through which the piece 101 of melting flows, and solidifying, without exceeding the outer diameter of the rotating shaft 102 -- the rivet 95 and the lug piece 104 -- fused-junction-do -- *****,

[0053]According to the example of an indication mentioned above, the following composition is obtained.

(Additional remark 9) In the curved pipe of the endoscope which allotted two or more **** which have a rotating shaft which intersects perpendicularly with the curving direction of an endoscope. inserting part to the longitudinal direction of the endoscope inserting part, and connected adjoining **** by the rivet mutually enabling free rotation, To one side of adjoining **** which has a rivet which consists of a narrow diameter portion and a major diameter, and is connected enabling free rotation. The curved pipe of the endoscope with which the verge of the narrow diameter portion end face of a shaft member which provided the rotating shaft hole with a slightly large path rather than said narrow diameter portion, and fitted said narrow diameter portion loosely into this rotating shaft hole is characterized by being slightly formed in a byway rather than a narrow diameter portion, and being fixed to **** of another side by the melting unification means.

[0054](Additional remark 10) In the curved pipe of the endoscope which connects two or more

**** which have the axis of rotation, The rotating shaft member arranged by fitting in loosely in said heights at said axis-of-rotation hole from the inside of **** which has an axis-of-rotation hole, and **** which has heights and a flange and has said axis-of-rotation hole, The flexible tube of the endoscope consisting of **** which has a jointing piece which covers said rotating shaft hole of **** which has said axis-of-rotation hole, and melting is carried out, and is formed in said shaft member and one.

[0055] Since the rivet miniaturized the joined part of **** in the longitudinal direction according to the composition mentioned above, It can be filled up now with built-in objects inserted in in an insert portion, such as a channel tube, an image guide fiber, and a light guide fiber, still with high density, and the improved efficiency of the endoscope was able to be achieved. On the contrary, this art can also be used for outer diameter narrow diameter-ization of an endoscope in the case where a built-in object is maintained.

[0056]

[Effect of the Invention] As explained above, while covering a wide observation area with a big curve angle according to this invention, it is effective in becoming observable from the optimal observation distance about the part which approached the insert portion if needed, and becoming possible to overlook a lesion part and to observe that there is nothing.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

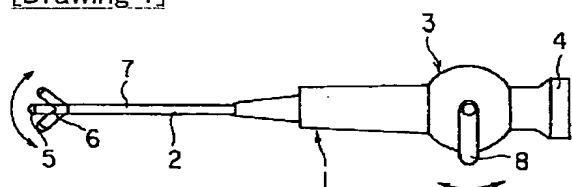
1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.*** shows the word which can not be translated.

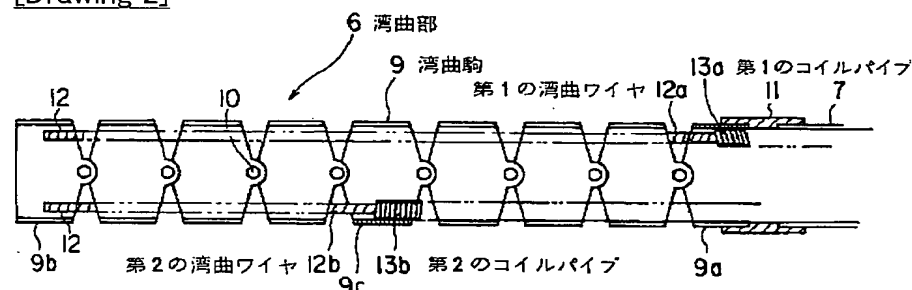
3.In the drawings, any words are not translated.

DRAWINGS

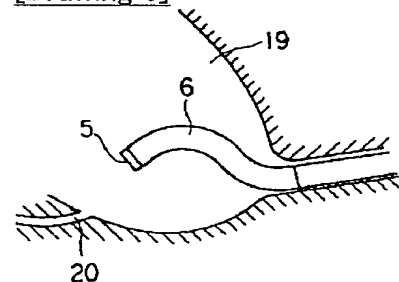
[Drawing 1]



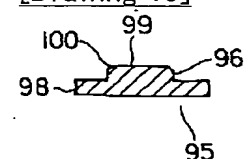
[Drawing 2]



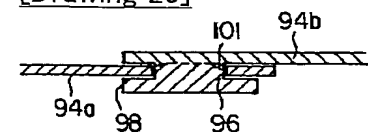
[Drawing 6]



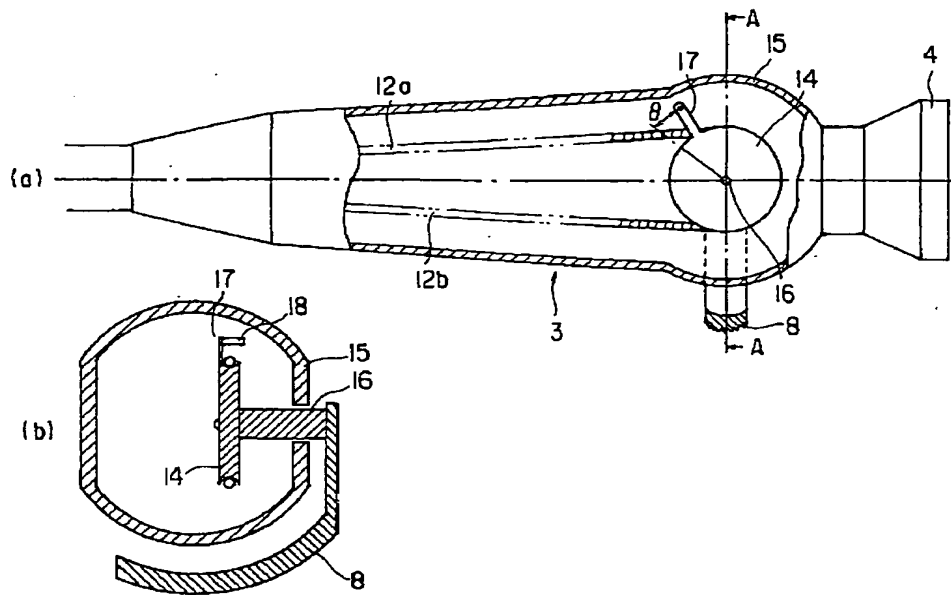
[Drawing 19]



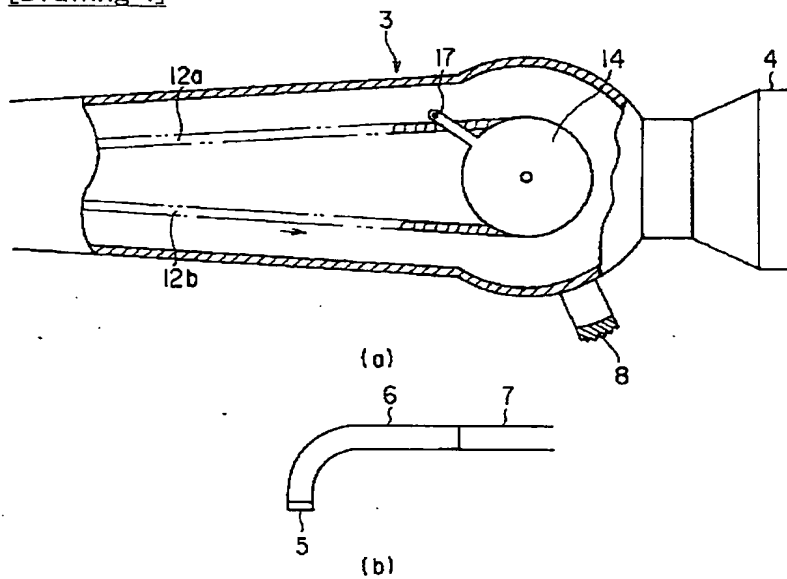
[Drawing 20]



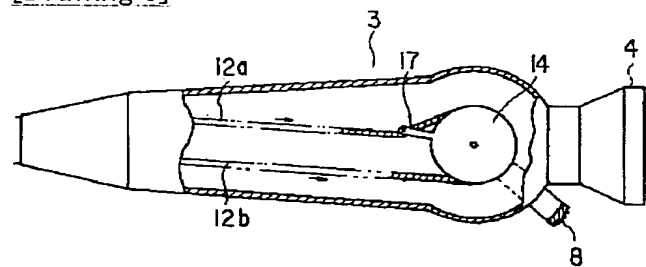
[Drawing 3]



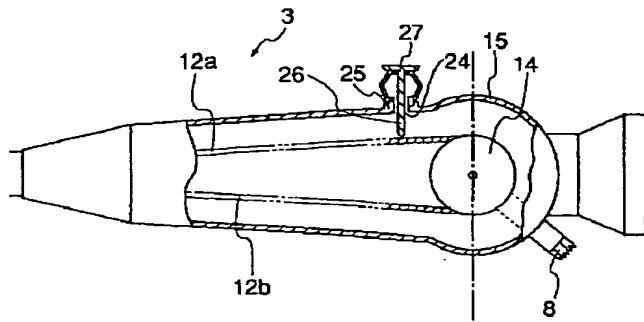
[Drawing 4]



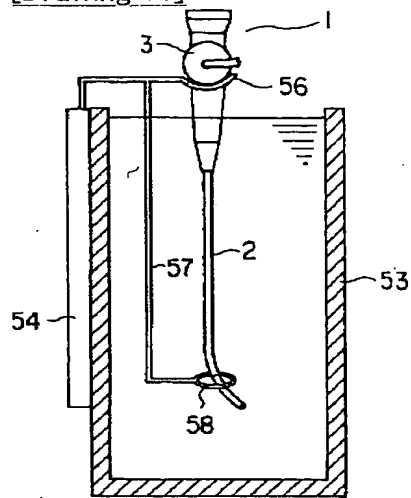
[Drawing 5]



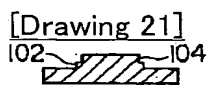
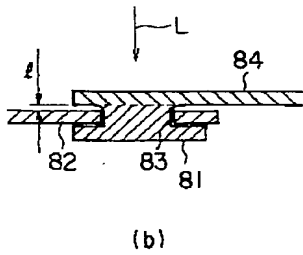
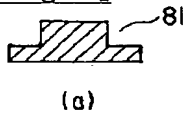
[Drawing 8]



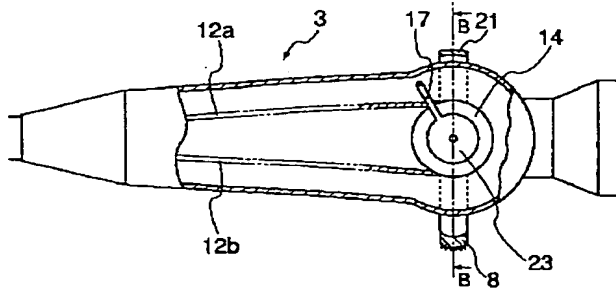
[Drawing 11]



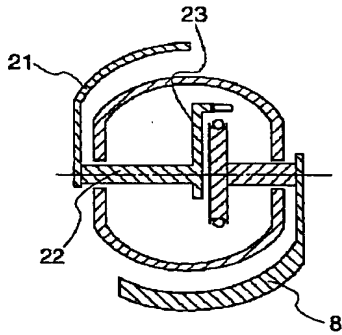
[Drawing 15]



[Drawing 7]

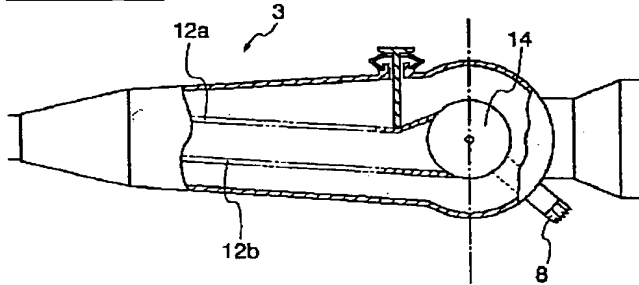


(a)

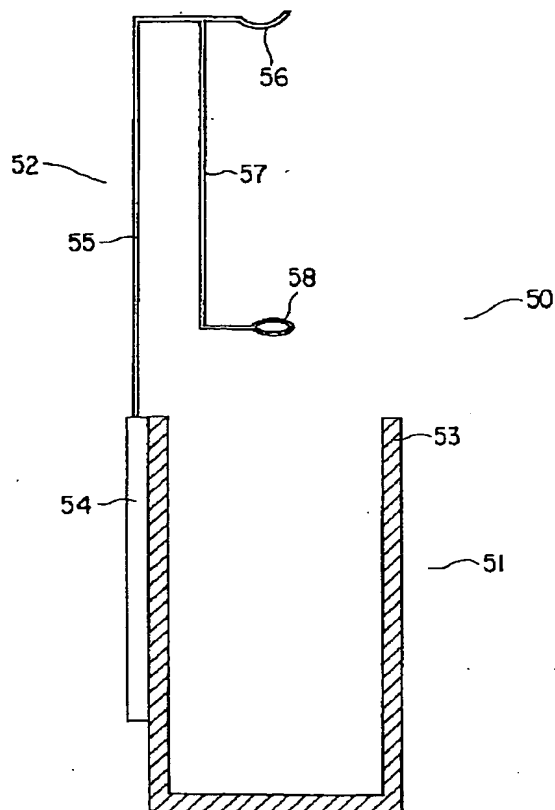


(b)

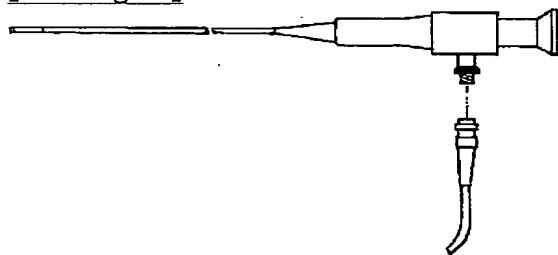
[Drawing 9]



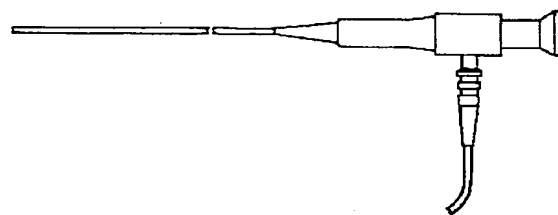
[Drawing 10]



[Drawing 13]

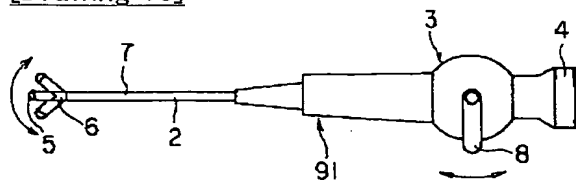


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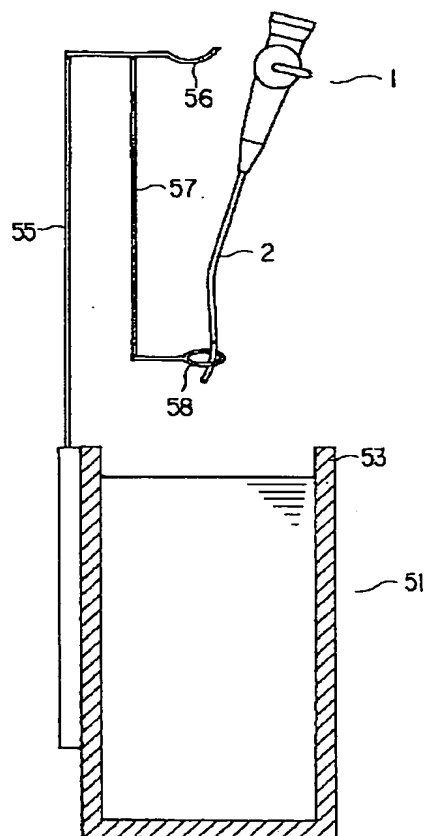


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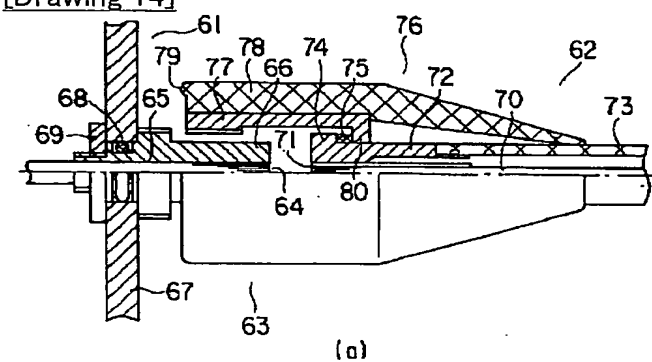
[Drawing 16]



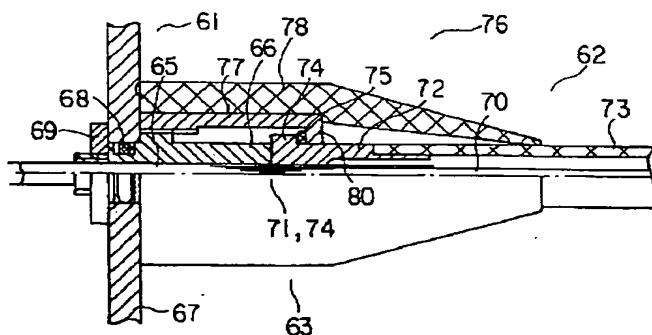
[Drawing 12]



[Drawing 14]

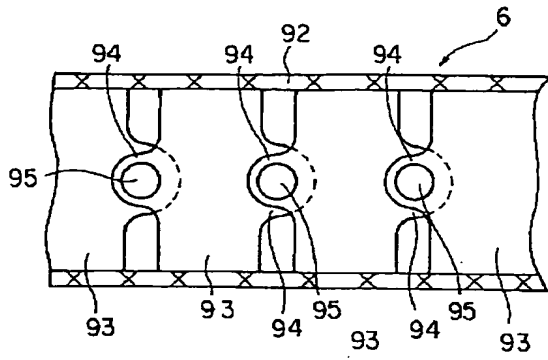


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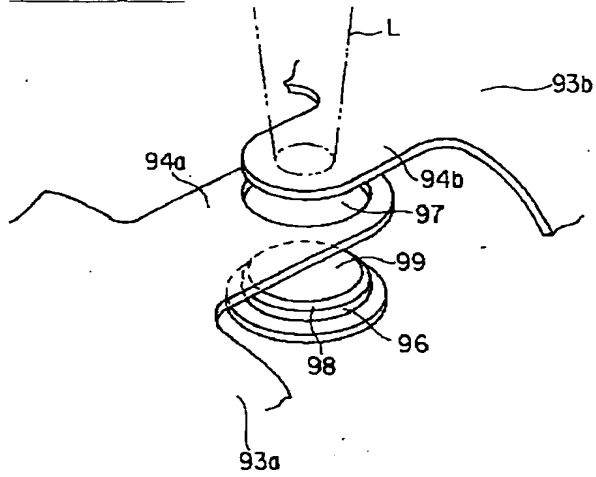


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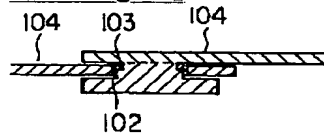
[Drawing 17]



[Drawing 18]



[Drawing 22]



[Translation done.]